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(necessarily previous to the deposition of the Bradford schists), the writer presumes an erosion interval between the very beds (Washington limestone and the slate) which he classes together (see p. 78 and Plate XIV).

"The Geology of Grand Isle" is the subject of a chapter by Dr. Perkins. This is the largest of the islands of Lake Champlain. The term "Champlainian" is used instead of "Ordovician," and "Beekmantown" instead of "Calciferous," upon grounds of priority. The much-folded and tilted Utica shales, resting on only slightly disturbed Trenton and Chazy beds, afford an excellent example of the different effects which the same orogenic movements may have on strata of different lithologic character and in different stratigraphic positions.

Peculiar concretion-like organic remains in the Chazy are believed to be sponges, and are placed by H. M. Seely in a new genus, Stephochetus. Four new species of this genus are described and figured. A petrographic description of the dikes of Grand Isle is given by H. W. Shirmer, of Columbia University.

The illustrations are numerous and especially good.

E. S. B.

Mineral Resources of the United States. Calendar Year 1901. By DAVID T. DAY. United States Geological Survey.

THE total value of our mineral production was $1,086,529,521 — a gain of 2.15 per cent. over that of 1900. For the second time it was more than a billion dollars. The twenty-two products whose value exceeded a million dollars each are, in order of their value, as follows: Coal, pig iron, copper, gold, silver (coining value), petroleum, stone (building), natural gas, lead, cement, brick clay, zinc, mineral waters, salt, phosphate rock, limestone (for iron flux), zinc white, clay (other than brick), aluminum, gypsum, quicksilver, and pyrite.

Coal.—The coal product of the United States for the year 1901 was the greatest in the history of the industry, its value being $348,910,464 — an increase of 14 per cent. The tonnage exceeded that of Great Britain and colonies, and was 75 per cent. greater than the output of Germany. The industry gave employment to 485,544 men. There were twenty-eight states and territories producing coal, and twenty-two of them show increased output, the greatest per cent. increase being that of North Dakota. Pennsylvania produced 51 per cent. of all the coal mined. Illinois ranked second with 9.6 per cent. West Virginia, Ohio, Alabama, Indiana, Kentucky, Colorado, and Iowa follow in the order named.

The anthracite product was $112,504,020 — an increase of 31 per cent. over that of the previous year. The average price at the mine was $2.05 per long ton, Pennsylvania producing all of this, though true anthracite has been produced for a number of years in Colorado and New Mexico.

The bituminous product was valued at $236,406,449. Of this the Appalachian field produced 67 per cent.; the central field (Illinois, Indiana, Kentucky), 16 per cent.; the western field (Iowa, Missouri, Kansas), 9 per cent.; the Rocky Mountain field, 6 per cent.; the coast field, 1 per cent.; and the Michigan field, ½ per cent. The average price at the mine was $1.05. The report includes statistics of labor, of accidents, and of the use of mining machinery, given by states.

The product of coke, included under coal, was $44,445,923. It is shown that by the beehive ovens now generally in use $18,000,000 worth of by-products, exclusive of gas, was wasted. Nor is this due to a lack of demand for these products, for we are paying, principally to Germany, $10,000,000 a year for these materials.

Petroleum.—The production of crude petroleum for the year was valued at $66,417,335 — the greatest in the history of the industry. There was a very remarkable increase in the production of Texas and California, a decrease in the Appalachian field, and a small gain in the Lima-Indiana region. The exports of petroleum products were the largest ever recorded, although there was a slight decrease in their value. The development of new pools in Texas, California, and at Boulder, Col., was attended by the organization of 1,478 companies representing a capitalization of $663,283,000. Of these only 556 produced petroleum. Prices varied from $0.28 per barrel in Texas to $7 for the natural lubricating oil of Wyoming. The average price was $0.96. From the results of analyses of the Beaumont petroleum the opinion is that, though it is eminently fitted for a fuel, the present known methods will fail to secure illuminating and lubricating derivatives in sufficient quantity to justify its refinement. The wide distribution and great production of the Texas fields "seem to assure the final result that Texas will in the course of time be at the head of the list of oil-producing states in this country."

New discoveries of oil in California are of far-reaching importance. There practically all of the coal must be imported, coming largely from British Columbia and Australia. This has prevented San Francisco from becoming a great manufacturing center, but this situation need no longer exist, for sufficient oil at low prices is piped directly to the city from the Kern county district. Like the Texas oil, the California product is low in illuminating and high in heating power, three and one-half barrels being equivalent to a ton of coal. The report includes extensive reviews of the oil production of the world.

Natural gas.—The value of the product was $27,067,500—an increase of 14 per cent. over the previous year. The pressure, however, has continued to decline, necessitating the expense of compression in order to market an increased production from declining fields. A total of 709,921 domestic fires and 5,742 factories and mills were supplied. The increase per cent. in production was greatest in Kansas.

Iron ore.—The production of 28,887,479 long tons was 5 per cent. greater than the production of any previous year and greater than the output of any other country, exceeding that of Germany, our nearest competitor, by more than 50 per cent. Of the twenty-five states mining iron, Minnesota ranked first, Michigan second, and Alabama third. The ores were hematite 93 per cent., magnetite 6 per cent., and carbonate less than 1 per cent. The Mesabi range in Minnesota, owing to the large deposits and the ease of working them, produced 32 per cent. of the total for the United States. About 200 cargo analyses of Lake Superior iron ore are given. The production of pig iron was worth $242,174,000 and exceeded the combined British and German production for the same year.

Gold.—The production for the year was $78,666,700—a decrease of 0.6 per cent. California increased her production over a million dollars and Nevada almost as much, her increase coming largely from the new camp of Tonapah in Nye county. Alaska and Colorado showed a decrease of about a million dollars each. The principal producing states and territories, in order of production, were as follows: Colorado, California, Alaska, South Dakota, Montana, and Arizona. About 85 per cent. of the production came from quartz and the remainder from placer mines.

Silver.—The commercial value of the yield was $33,128,400—about 4 per cent. less than that of the previous year. The greatest gain was in Utah, most of which came from the Park City district. Colorado and Montana showed a material decrease. About 29 per cent. came from quartz mining and the remainder from lead and copper ores.

Copper.—The year's production was valued at $87,300,515—a decrease of 11 per cent. This decrease was due chiefly to the lower prices prevailing, the quantity mined falling off less than 1 per cent. The product of the United States was considerably more than that of all other countries combined. Of this Montana produced 38 per cent., the Lake Superior region 26 per cent., and Arizona 22 per cent. Statistics are given showing the cost of operation and the profits of various mines, with a résumé of the foreign and domestic copper trade.

Lead.—The value of the lead mined in 1901 was $23,280,200, this being something less than that of the preceding year. Idaho stood first in production, Colorado second, and the Mississippi valley districts third. Important developments of lead properties are now going on in southeast Missouri, and it is believed that a material increase of output will follow.

Zinc.—The value of the zinc production was $11,265,760. The quantity mined was the greatest in the history of the industry, being 25 per cent. of the world's production. More than half of this ore came from the Joplin, Mo., district. The features of the year were the removal of smelting properties to the Kansas natural-gas district and a futile attempt to consolidate the smelting interests.

Aluminum.—The Pittsburg Reduction Co. is the sole producer of aluminum in the United States. The value of the product was $1,920,000, this being half the output of the world. As an electrical conductor, aluminum continues to increase in favor. Beauxite, the ore of aluminum, was mined in Georgia, Alabama, and Arkansas. The new field at Beauxite, Ark., is one of great promise.

Quicksilver.—The production of $1,382,305 came chiefly from California, though Texas contributed a small amount. The ores being worked are very lean, and the outlook for increased production is unpromising.

Precious stones.—The production of the United States was $289,050, while the importation was $22,815,352. The jewelry trade is a very sensitive barometer of the general financial situation, and the great importation of precious stones clearly reflects the remarkable prosperity of the country.

W. H. E.